* * REASONS FOR AMENDMENTS AND REMARKS * *

Applicants wish to acknowledge with appreciation the Examiner's detailed analysis and efforts in examining this application. A "marked-up" version of the amended claims is submitted concurrently at the end of this section pursuant to 37 C.F.R. § 1.121(c)(1)(iii).

On pages 2 and 3 of the Official Action, the Examiner rejected Claims 1 through 5, 7 through 29, 31 through 36, 38 through 40, 42 through 48, and 51 under 35 U.S.C. § 103(a) as being obvious under Miller (U.S. Patent No. 5,563,351) in view of Buck, et al. (U.S. Patent No. 5,996,422).

The Examiner alleges that Miller discloses maintenance of a pump having wear parts, processor, memory, operational data of the pump storing in the memory from a sensor, storing part identification and the wear part, ability to update and compare the data to determine if a particular part needs to replace, ability to modify the operation of the pump according to data from sensor, etc. The Examiner indicates, however, that Miller does not disclose a diaphragm-type pump and that Buck discloses such usage of the diaphragm-type pump.

The Examiner, therefore, alleges that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a diaphragm pump as suggested by Buck to predict wear in the system.

Claim 1 has been amended to include "sensing at least one structural operating behavior of the pump." Support for such an amendment can be found, as an illustrative example, on page 11, lines 14 through 17, of the specification. This limitation is sensing the behavior of a structure or component of the pump itself. Miller, on the other hand, discloses, as the Examiner indicates, monitoring devices like a flow meter connected to the case drain line (see column 2,

Further, on page 3 of the Official Action, the Examiner rejected Claims 6, 30, and 37 under 35 U.S.C. § 103(a) as being obvious under the combination of Miller and Buck as applied to the claims above, and further in view of Kubota, et al. (U.S. Patent No. 6,192,299). The Examiner alleges that the Miller and Buck combination discloses a method including the subject matter discussed above, except for the usage of the check valve in the system, and that Kubota uses a check valve in the system to direct flow.

The Examiner consequently alleges that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have an accurate automatic measured system to adjust the operation of a pump.

As a result of the previously discussed amendments and arguments to Claims 1, 17, 31, 39, 48 and 51, this rejection to Claims 6, 30 and 37 is believed moot. It is, thus, respectfully requested that this rejection be withdrawn as well.

Also on pages 3 and 4 of the Official Action, the Examiner rejected Claim 41 under 35 U.S.C. § 103(a) as being obvious under the combination of Miller and Buck as applied to Claim 39, and further in view of Selman (U.S. Patent No. 5,237,539). The Examiner alleges that the Miller and Buck combination discloses a method including the subject matter discussed above, except for the usage of a proximity switch in a pump system. The Examiner further alleges, however, that Selman discloses a usage of a proximity switch in a pump system. The Examiner indicates, thusly, that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a proximity switch in a pump system to get real time data as suggested by Selman.

Again, as a result of the previously discussed amendment to Claim 39, this rejection to Claim 41 is believed moot. It is, thus, respectfully requested that this rejection be withdrawn as well.
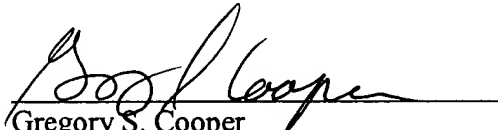
-10-

If, upon consideration of the above, the Examiner should feel that there remain outstanding issues in the present application that could be resolved, the Examiner is invited to contact Applicants' patent counsel at the telephone number given below to discuss such issues.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. To the extent additional fees are required, please charge the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 02-1010 and please credit any excess fees to such deposit account.

Respectfully submitted,

Gregory S. Cooper
Reg. No. 40,965
(260) 425-4660

MARKED-UP VERSION OF REWRITTEN CLAIMS
IN AMENDMENT TO U.S. PATENT APPLICATION NO. 09/584,570
ATTORNEY DOCKET NO. 28908/82353

Please amend Claims 1, 4, 6, 8, 12, 17, 19, 20, 21, 22, 24, 25, 26, 27, 31, 37, 39, 48, and 51, as follows:

1.   (Amended) A method of facilitating maintenance of a pump comprising the following steps:

providing a pump including wear parts, a processor and memory;

sensing at least one **structural** operating **behavior** [condition] of the pump indicative of the operation of the pump;

generating operational data reflective of the sensed operating **behavior** [condition];

storing the generated operational data in the memory;

storing parts identification data identifying wear parts of the pump in the memory;

storing at least one predetermined level of operational information;

operating the processor to compare the stored predetermined level to the stored operational data and in dependent response thereto outputting information as to the desirability of replacing or repairing at least one selected wear part.

4.   (Amended) The method of claim 1 wherein the pump comprises a pumping element and the **structural** operational **behavior** [condition] of the sensing step is a physical integrity of the pumping element of the pump.

6. (Amended) The method of claim 2 [1] wherein the pump comprises a check valve and the operational condition of the sensing step is a reverse fluid flow through the check valve.

8. (Amended) The method of claim 2 [1] further comprising the following step:

operating the processor to compare the stored predetermined level to the stored operational data and in dependent response thereto outputting information as to the desirability of modifying the operation of pump.

12. (Amended) The method of claim 1 [8] wherein the pump comprises a pumping element and the **structural** operational **behavior** [condition] of the sensing step is a temperature of the pumping element of the pump.

17. (Amended) A method of modifying an operation of a pump comprising the following steps:

providing a pump, a processor and memory;

sensing at least one **acoustical signal generating** operating condition of the pump indicative of the operation of the pump **with an acoustical signature sensor**;

generating operational data reflective of the sensed operating condition;

storing the generated operational data in the memory;

storing at least one predetermined level of operational information;

operating the processor to compare the stored predetermined level to the stored operational data and in dependent response thereto outputting information as to the desirability of modifying the operation of pump.

19. (Amended) The method of claim 18 [17] wherein the operational condition of the sensing step is an output flow rate of the pump.

-13-

20.   (Amended) The method of claim **18** [17] wherein the operational condition of the sensing step is a cycle rate of the pump.

21.   (Amended) The method of claim **18** [17] wherein the operational condition of the sensing step is an acceleration of a cycle rate of the pump.

22.   (Amended) The method of claim **18** **[17]** wherein the pump comprises a pumping element and the operational condition of the sensing step is a temperature of the pumping element of the pump.

24.   (Amended) The method of claim **18** [17] wherein the pump is an air operated diaphragm pump comprising an air chamber and the operational condition of the sensing step is a back pressure in the air chamber.

25.   (Amended) The method of claim **18** [17] wherein the pump comprises at least one pumping chamber and the operational condition of the sensing step is a filling rate of the pumping chamber.

26.   (Amended) The method of claim **18** **[17]** wherein the operational condition of the sensing step is a suction pressure of the pump.

27.   (Amended) The method of claim **18** [17] wherein the pump comprises wear parts and the method further comprises the following steps:

storing parts identification data identifying wear parts of the pump in the memory; and

operating the processor to compare the stored predetermined level to the stored operational data and in dependent response thereto outputting information as to the desirability of replacing or repairing at least one selected wear part.

31.   (Amended) A pump comprising:

at least one wear part, a processor and memory, at least one **acoustical** sensor for sensing at least one operating condition of the pump, and a display,

the **acoustical** sensor communicating operational data reflective of the sensed operating condition to the processor, the processor storing the operational data in the memory and updating the stored operational data upon receipt of new operational data from the sensor,

the memory also comprising parts identification data identifying wear parts of the pump and at least one predetermined level of operational information,

the processing comparing the stored predetermined level to the stored operational data and in dependent response thereto outputting information to the display as to the desirability of replacing or repairing at least one selected wear part.

37.   (Amended) The pump of claim 31 wherein the wear part is a check valve and **comprises a** [the senor] **sensor that** senses a reverse fluid flow through the check valve.

39.   (Amended) A pump comprising:

at least one wear part, a processor and memory, at least one sensor for sensing at least one **acoustical signal generating** operating condition of the pump, and a display,

the sensor communicating operational data reflective of the sensed operating condition to the processor, the processor storing the operational data in the memory and updating the stored operational data upon receipt of new operational data from the sensor,

the memory also comprising parts identification data identifying wear parts of the pump and at least one predetermined level of operational information,

the processor comparing the stored predetermined level to the stored operational data and in dependent response thereto outputting information to the display as to the

desirability of replacing or repairing at least one selected wear part modifying the operation of the pump.

48.   (Amended) A method of facilitating maintenance of a pump comprising the following steps:

providing a pump including wear parts, a processor and memory;

sensing at least one **acoustic** signature signal of the pump indicative of the operation of the pump;

storing the sensed signature signal in the memory;

storing parts identification data identifying wear parts of the pump in the memory;

storing at least one predetermined signature signal;

operating the processor to compare the stored predetermined signature signal to the stored sensed signature signal and in dependent response thereto outputting information as to the desirability of replacing or repairing at least one selected wear part.

51.   (Amended) A pump comprising:

at least one wear part, a processor and memory, at least one sensor for sensing at least one **acoustical** signature signal of the pump, and a display,

the sensor communicating the sensed signature signal to the processor, the processor storing the signature signal in the memory and updating the stored signature signal upon receipt of a new signature signal from the sensor,

the memory also comprising parts identification data identifying wear parts of the pump at least one predetermined signature signal,

the processor comparing the stored predetermined signature signal to the stored signature signal and in dependent response thereto outputting information to the display as to the desirability of replacing or repairing at least one selected wear part.